

**EPA Superfund  
Record of Decision:**

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*12-32-98*



# **RECORD OF DECISION**

## **GIRARD POINT MANAGEMENT AREA**

### **PHILADELPHIA NAVAL COMPLEX**

**DECEMBER 1998**

**RECORD OF DECISION**  
Girard Point Management Area  
Philadelphia Naval Base  
Philadelphia, Pennsylvania

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## **RECORD OF DECISION**

### **DECLARATION**

#### **SITE NAME AND LOCATION**

Girard Point Management Area  
Philadelphia Naval Complex  
Philadelphia, Philadelphia County, Pennsylvania

#### **STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected remedial action for the Girard Point Management Area (GPMA), at the Philadelphia Naval Complex in Philadelphia, Pennsylvania which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and to the extent possible the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based upon the contents of the administrative record for this site.

Both the United States Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PADEP) concur with the selected remedy.

#### **DESCRIPTION OF THE SELECTED REMEDY**

The Navy has identified the selected remedy at the **Girard Point Management Area** at the Philadelphia Naval Complex in Philadelphia, PA (Figure 1). The Navy's selected remedy is based on the following already established Base-wide Institutional Controls:

- Ground water withdrawn from wells shall not be used or made available for human consumption (Base-wide Institutional Control)
- GPMA shall not be used or developed for any permanent residential uses (Base-wide Institutional Control).
- Any construction or development of an outdoor childcare playground will include the placement of 2 ft of clean fill material, or other cover as approved by PADEP, between the underlying soil and the surface of the childcare playground prior to commencement of any use of the outdoor area as a playground (Base-wide Institutional Control).

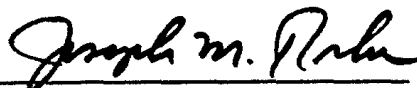
The following remedy has been selected specifically for the Girard Point Management Area:

- A vegetative cover of the landfill area (Zone A). This will consist of a permeable geomembrane and a minimum two feet soil cover to reduce dermal and inhalation pathway. Vegetation will provide a buffer from between the Schuylkill River and any industrial activity, and will consist of native grasses and shrubs.
- Asphalt paving of an adjacent parking lot to reduce dermal and inhalation pathway. (Zone B).
- Removal of surface soils surrounding the incinerator.
- Dismantle the incinerator stack incinerator units and decontaminate and the incinerator building.
- Long Term Shallow Ground Water monitoring in accordance with an EPA and PADEP reviewed Long Term Monitoring Plan
- An Institutional Control such that excavation shall not be accomplished without prior written approval of PADEP.

Five-year reviews will be conducted to evaluate whether additional remedial actions are required. A report will be generated detailing each five-year review evaluation.

#### **DECLARATION STATEMENT**

Pursuant to the duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606 that this remedial action is necessary to ensure protection of human health and the environment, and that this alternative complies with federal and state requirements that are legally applicable or relevant and appropriate to the site.

  
Joseph M. Roche  
BRAC Environmental Coordinator

30 December 1998  
Date

## 1) SITE NAME, LOCATION AND DESCRIPTION

The GPMA is a peninsula located in the northwest area of the Philadelphia Naval Base at the confluence of the Schuylkill and Delaware Rivers. See Figure 1 for Philadelphia Naval Base Site Location Map and Figure 2 for the GPMA Site Location Map. This generally flat vegetated 25 acre site includes two landfills - Installation Restoration Program (IR) Sites 4 and 5, a former transformer storage area (IR Site 3), a former Resource Conservation and Recovery Act (RCRA) storage facility, and the former Girard Point incinerator (Building 668). The GPMA was historically used for the treatment, storage, and disposal of solid wastes generated at the Philadelphia Naval Base. Portions of the area were created by landfilling associated with these waste management activities. Evidence of landfilling activities is supported by soil borings and test pit excavations which have confirmed the presence of construction debris, incinerator ash, suspected foundry slag/sand, blasting grit used for paint removal, and miscellaneous municipal waste as well as soil and fill materials (river dredge materials).

To accelerate cleanup of the Girard Point Management Area (GPMA) the Girard Point Management Plan was developed in 1995 using the United States Environmental Protection Agency (EPA) directive, "Presumptive Remedy for CERCLA Municipal Landfill Sites". One of the objectives of the presumptive remedy strategy is to shorten the Feasibility Study (FS) process by targeting remedial options considered during the screening of alternatives and detailed analysis. Treatment and/or removal of the landfill material were considered impractical due to the heterogeneity and volume of the landfill material, therefore the primary remedial components are source control and containment. According to the presumptive remedy strategy, landfills with a content of more than 100,000 cubic yards would normally not be considered for excavation and removal. Landfill covers or caps address source control and containment under the presumptive remedy strategy.

The following early removal actions were implemented to focus investigations and remediation on the most critical areas of concern, and to facilitate source control and containment:

- Bank stabilization along the shoreline of IR Sites 4 and 5,
- Storm-water sewer engineering survey including line cleaning,
- Underground storage tank removals, and
- Implementation of the presumptive remedy strategy.

In order to evaluate the nature and extent of the Constituents of Potential Concern (COPC) at the site and the risks posed to potential receptors, GPMA was divided into two operable units: Zones A and B. Zone A, which is a landfill that contains municipal-type wastes, consists of IR Site 4 and IR Site 5. This zone covers an area of 11.2 acres and includes approximately 280,000 cubic yards of fill. Zone B consists of IR Site 3, Budding 668, the North West Parking Lot (NWPL), and the area West of the NWPL. Zone B covers an area of 13.2 acres and includes approximately 86,000 cubic yards of fill.

The I-95 Girard Point bridge, spanning the Schuylkill River, passes directly over and bisects the site. Two federally listed endangered species are known to inhabit the area at or near the GPMA. The peregrine falcons have nested on the I-95 Girard Point bridge and the shortnose sturgeon are known to inhabit the Delaware River near Philadelphia and probably present at the mouth of the Schuylkill River. The nearest civilian residential population, a section of south Philadelphia, is

located approximately 1-1/2 miles to the northeast. Also located to the northeast are a public golf park and a city park, Roosevelt Park. The park and golf course are located within 1/2 mile of the site.

The site was marshlands until it was covered with fill material between 1940 to 1970. The general land area surrounding the GPMA is densely populated within one mile to the northeast and heavily industrialized within one mile to the north with oil refining and petrochemical plants. The 100 year flood elevation line is 10 ft above mean sea level (msl) referenced to the National Geodetic Vertical Datum of 1929 (NGVD 1929). Elevations of the riverbank along the GPMA range from 15-18 ft above msl along the southwest portion of the GPMA at IR Site 4 to 10-12 ft msl along the south portion of the GPMA at IR Site 5. In 1994, wetlands were delineated at the Philadelphia Naval Base. Wetland locations were identified along the northwest corner of the GPMA during a 1994 study.

A more complete description of the sites can be found in the *Site Characterization Report* (Stone & Webster, 1997).



## 2) SITE HISTORY AND ENFORCEMENT ACTIVITIES

### Site Use and Response History

IR Site 4 comprises a landfill area of approximately 6 acres. Site history and aerial photography reviews indicated waste disposal activities occurred between 1940 and 1970. Construction of the Girard Point Incinerator (i.e., Building 668) at the eastern border of IR Site 4 in the early 1940s marked the beginning of waste management operations within the GPMA. Incinerator ash and debris generated at Building 668 were reportedly disposed by filling within the immediate area of Building 668. Solid wastes that could not be incinerated, such as metal debris and concrete, were also placed in IR Site 4. These fill materials were identified in the Remedial Investigations (RI) as the main source of COPC. Stone & Webster issued the Final RI report for IR Site 4 in May 1997. An early removal action consisting of a bank stabilization project was completed at IR Site 4 to mitigate potential human health and ecological risks.

An initial concern identified at the site was the alleged disposal of 50 to 60 pallets of gas cylinders of unknown contents just after World War II. A former shipyard employee who was part of the working crew assigned to the burial of the cylinders identified their potential existence. After extensive review of records, interviews, and geophysical investigations in the area, excavation was accomplished at the most likely burial area in September 1992. This area was excavated and field inspected, but no cylinders were found. Upon completion of the excavation activities and field inspection, the Navy concluded, "there are no cylinders buried at IR Site 4 and according to the agreement (with the EPA), the Navy will no longer pursue the search for cylinders at the site."

IR Site 5 is a landfill that covers approximately 5 acres and contains mostly waste blasting grit, along with construction debris, miscellaneous debris that was not incinerated at Building 668, and incinerator ash. IR Site 5 shares a similar landfiling history with IR Site 4 in that filling operations occurred from the early 1940s until 1970. Fill material at IR Site 5 was found to range in depth from 7 to 14 ft below ground surface (bgs). Stone & Webster issued the Final RI report in May 1997. Bank stabilization for IR Site 5 was completed in 1997. Other than IR Sites 4 & 5, the remaining of Girard Point was used for waste storage.

A detailed description of the site use and response histories can be found in the *Final Remedial Investigation Report IR Site 4* (Stone & Webster, 1997a), *Final Remedial Investigation Report* (Stone & Webster, 1997b), and the *Final Site Characterization Report* (Stone & Webster, 1997c). A list of the previous reports can be found in Table 1-1 Summary of Previous Reports in the *Final Site Characterization Report*.

### ENFORCEMENT HISTORY

The U.S. Navy is responsible for addressing environmental concerns at the Philadelphia Naval Complex, pursuant to Section 120 of CERCLA. Investigation and cleanup of DOD sites, such as the Philadelphia Naval Complex, are funded through the Department of Defense.

### **3) COMMUNITY PARTICIPATION**

The Navy has kept the community and other interested parties apprised of site activities through Restoration Advisory Board (RAB) meetings, which involve community representatives in the clean-up program. The Navy released a community relations plan which outlined a program to address community concerns and keep citizens informed. Public participation requirements of CERCLA Section 113(k)(2)(B)(i-v) and 117 were met in the remedy selection process.

The administrative record is available for public review at the Philadelphia Naval Business Center, Building 501. The Navy published a notice and brief analysis of the Proposed Plan in the Philadelphia Inquirer May 28, 1998, South Philadelphia review on May 28, 1998 and Southwest Philadelphia Review on May 29, 1998.

On June 25, 1998, the Navy held an informational poster session to present the results of the RI and the cleanup alternatives presented in the FS and to present the Proposed Plan and answer any questions. The session was held at the Holy Spirit Parish house, 1900 Greary Street, Philadelphia. The Navy held a 30 day public comment period which ended July 2, 1998 to accept public comment on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public.

This Record of Decision presents the selected remedial action for GPMA of the Philadelphia Naval Complex in Philadelphia, Pennsylvania, chosen in accordance with the procedures established by CERCLA, as amended by SARA. The decision for the site is based on the Administrative Record, which was available for public review at the Philadelphia Naval Business Center, Building 501 (pass Office) South Broad Street, Philadelphia Pennsylvania.

#### 4) SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The selected remedy was developed by combining components of different source control and management of mitigation alternatives to obtain a comprehensive approach for site remediation. The selected remedy for Zone A consists of a permeable cover, which consists of a geotextile/permeable liner and a vegetated soil cover. The liner will mark the location of the waste, but not eliminate infiltration of water. The cover will consist of two feet of soil, which will be vegetated with native grasses and shrubs. This remedy prohibits exposure with the soil to protect human health and the environment. It also provides a vegetated buffer between the Schuylkill River (and its ecology) and the area adjacent to GPMA, which is proposed for heavy industrial reuse in the City of Philadelphia's Reuse Plan dated September 1994. The selected remedy for Zone B, which consists of paving returns, the area to its former use as a parking lot and prohibits exposure with the soil to protect human health and the environment. Within Zone B, the removal of soils and decontamination of the incinerator remove possible source areas and eliminate exposure to these areas.

The institutional controls, five-year reviews and long term monitoring plan will ensure that the remedy, will continue to be protective of human health and the environment.

#### 5) SUMMARY OF SITE CHARACTERISTICS

The *Final Site Characterization Report* contains an overview of the site investigation conducted at the GPMA. The notable findings of the site investigation are summarized below.

##### Nature and Extent

COPC were identified in surface soil, subsurface soil and ground water samples collected throughout the GPMA. COPC were identified as those analytes detected above media specific human and ecological risk-based concentrations as presented in the *Final Site Characterization Report*. COPC identified for human health and ecological risk assessment at the GPMA included semi-volatile organic compounds (SVOC), pesticides, polychlorinated biphenyls (PCB), metals, dioxins, and asbestos. SVOC, PCB, metals, dioxins, and asbestos were detected in surface and subsurface soil samples at concentrations above screening levels. Pesticides were only detected at concentrations above screening levels in surface soil. The main source of COPC is landfill material, although in this highly industrialized area sources from other industries cannot be ruled out. Differences between vertically adjacent samples and the absence of similar COPC in nearby and/or downgradient ground-water samples suggest that the COPC are being retained in the fill and are not migrating through soil to the ground water or off-site.

COPC identified in ground water included SVOC, pesticides, PCB, and metals. Maximum detected concentrations were detected in wells located throughout the GPMA - both upgradient and within the landfilled area, Zones A and B.

##### Fate and Transport

As part of the *Final Site Characterization Report*, a risk assessment was conducted to estimate the potential risks to human health posed by the waste attributable to the GPMA. The report also estimated the ecological risks from GPMA. The physical-chemical characteristics of the COPC and

site conditions identified the potential for site COPC migration. The site COPC will likely adhere or adsorb to soil particles reducing their mobility in the environment and the potential for migration of COPC offsite. According to the *Final Site Characterization Report*, transport of COPC may be possible via the following pathways:

- surface soil to surface water via erosion,
- ground water to surface water via ground-water discharge,
- surface soil to shallow aquifer ground water to deep aquifer ground water via infiltration, and
- Surface and subsurface soil to air via fugitive dust generation.

COPC transported through erosion of surface soil to the Schuylkill River or the Reserve Basin Inlet is no longer likely to occur due to the implementation of bank stabilization at Zone A. In addition, the site topography slopes away from the Schuylkill River and Reserve Basin Inlet therefore, COPC would likely be transported toward the interior of the site.

Transport of the COPC via ground-water movement may discharge COPC into the Schuylkill River. However, transport via ground-water movement are impeded by mechanisms such as natural attenuation and dispersion.

The potential for downward migration of COPC via water infiltration through surface soil to ground water would be limited by the low permeability of the native soil, native soil thickness, and low hydraulic gradients across the native soil. As indicated in ground water and constituent transport models presented in the *Site Characterization Report*, COPC are not likely to migrate to the deep aquifer over the next 100 years.

The most significant pathway for COPC transport away from the GPMA is fugitive dust migration, which may potentially be inhaled. COPC may migrate as they adsorb to soil particles, which may become airborne as a result of on-site construction or excavation.

A complete discussion of site characteristics can be found in the *Remedial investigation Report: IR Site 4*, the *Remedial Investigation Report: IR Site 5*, and the *Site Characterization Report*.

## 6) SUMMARY OF SITE RISKS

The Site Risks were estimated based on the following already established Base-Wide Institutional Controls:

- ! Ground water withdrawn from wells shall not be used or made available for human consumption (Base-wide Institutional Control)
- ! GPMA shall not be used or developed for any permanent residential uses (Base-wide Institutional Control).
- ! Any construction or development of an outdoor childcare playground will include the placement of 2 ft of clean fill material, or other cover as approved by PADEP, between the underlying soil and the surface of the childcare playground prior to commencement of any use of the outdoor area as a playground (Base-wide Institutional Control).

### Human Health

The quantitative human health risk evaluation for the GPMA considered two zones, Zone A which considered the presumptive remedy of a cover and Zone B which assumed no cover. Both zones were evaluated independently to determine quantitative risks to human health as a result of exposure to soil. Risk associated with exposure to ground water was evaluated for the entire GPMA. The HHRA assessed the toxicity, or degree of hazard, posed by contaminants related to the site and involved describing the routes by which humans and the environment could come in contact with these substances. Separate calculations were made for those substances that can cause cancer (carcinogenic) and for those that can cause non-cancerous, but adverse, health effects.

The **National Oil and Hazardous Substances Pollution Contingency Plan** (NCP) established acceptable levels of carcinogenic risk ranging from one excess cancer case per 10,000 people exposed to one excess cancer case per 1,000,000 people exposed. This translates to a risk range between one in 10,000 and one in 1,000,000 additional cancer cases. Expressed as a scientific notation, this risk range is between  $1.0E-04$  and  $1.0E-06$ . Remedial action may be warranted at a site when the calculated cancer risk level exceeds  $1.0E-04$ . However, since EPA's clean-up goal is generally to reduce the risks to  $1.0E-06$  or less, EPA may take action where the risk is within the range between  $1.0E-04$  and  $1.0E-06$ .

The NCP also states that sites could pose a health threat due to a non-cancerous, but otherwise hazardous, substance. EPA defines non-carcinogenic threat by the ratio of the contaminant concentration at the site that a person may encounter to the established safe concentration. If the ratio, called the **Hazard Index** (HI), exceeds one (1.0), there may be concern for potential non-carcinogenic health effects associated with exposure to the chemicals. The HI identifies the potential for the most sensitive individuals to be adversely affected by the non-carcinogenic effects of chemicals. As a rule, the greater the value of the HI, the greater the level of concern.

Potential human health risks associated with exposure to the COPC were estimated quantitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to COPC based on the potential future uses and location of the GPMA. The most foreseeable uses are warehousing of light industrial activities. Zone A exposures were not evaluated under a current use scenario since it was assumed that the presumptive remedy, which includes a cover, would be implemented. The future use scenario

assumes the presumptive remedy has been implemented. RI data were used to characterize the human health risks. Exposure parameters for each exposure route and receptor were estimated under average exposure (AE) and reasonable maximum exposure (RME) assumptions.

### **Zone A**

For Zone A, it was assumed the presumptive remedy of a landfill cover was installed and institutional controls would be in place. With this remedy assumed to be in place, only the risk to construction workers was evaluated. The exposure routes evaluated in the HHRA included

- ! Incidental ingestion of surface soil
- ! Inhalation of suspended particulate from the surface soil during excavation and construction work.

All TCL and TAL data were validated and used for the HHRA. The analytical results were screened using current EPA Region III Risk-Based Concentration (RBC) screening levels. Representative concentrations for each contaminant of potential concern (CoPC) were calculated using the latest risk assessment guidance from EPA.

The following table provides the total noncancer and cancer risks at Zone A.

**Table 1 – Zone A - Total Reasonable Maximum Exposure Risks**

| <b>Exposed Group</b>         | <b>Noncancer</b> | <b>Cancer</b>                 |
|------------------------------|------------------|-------------------------------|
| Construction/Utility Workers | <b>25.46</b>     | <b>3.75 x 10<sup>-3</sup></b> |

This exceeds the EPA Hazard Index of 1.0 for noncancer risk and the recommended risk range of 1.0E-4 to 1.0E-6 for cancer risks.

### **Zone B**

During the investigation, the presumptive remedy was not assumed at Zone B, therefore total non-cancer and cancer risks were estimated as a result of the potential of exposure of maintenance workers, occasional users/trespassers, and construction/utility workers to

- ! Incidental ingestion of surface soil
- ! Inhalation of suspended particulate from the surface soil

Lead was also considered a CoPC at Zone B. The following table provides the total noncancer and cancer risks at Zone B. The majority of models assessing risks associated with exposure to lead in soil have been developed for residential scenarios where individuals are exposed continuously, on a daily basis. Recently the Technical Review Workgroup for Lead put together a revised lead model to assess lead soil risks to individuals such as construction workers, maintenance workers, etc. This approach uses a methodology to relate soil lead intake to blood lead levels (BLL) of fetuses in pregnant women. These are presumed to be the most sensitive population.

**Table 2 – Zone B Total Reasonable Maximum Exposure Risks (Before Removal of Incinerator Soils)**

| <b>Exposed Group</b>                       | <b>Non-cancer</b> | <b>Cancer</b>         | <b>Blood Lead Level*</b> |
|--|-------------------|-----------------------|--------------------------|
| Construction/Utility Worker                | <b>7.69</b>       | $2.51 \times 10^{-5}$ | <b>571.54</b>            |
| Maintenance Workers                        | <b>2.70</b>       | $1.20 \times 10^{-4}$ | <b>119.07</b>            |
| Occasional Users/Trespassers (adolescents) | <b>4.39</b>       | $2.51 \times 10^{-5}$ | <b>119.07</b>            |

\*Blood Lead Level Values in ug/dL (micrograms per deciliter)

This exceeds the EPA Hazard Index of 1.0 for noncancer risk, the recommended risk range of  $1.0E-4$  to  $1.0E-6$  for cancer risks, and 10ug/dL as a reference blood lead level.

It was noted in the investigation that removal of surface soil around the incinerator would reduce the Human Health Risk for the entire Zone B. Below are the calculated risks assuming these soils would be removed to a level below the highest COPC level in the remainder of Zone B.

**Table 3 - Zone B Total Reasonable Maximum Exposure Risks (After Removal of Incinerator Soils)**

| <b>Exposed Group</b>                       | <b>Non-cancer</b> | <b>Cancer</b>         | <b>Blood Lead Level*</b> |
|--|-------------------|-----------------------|--------------------------|
| Construction/Utility Worker                | 0.51              | $6.50 \times 10^{-5}$ | <b>19.70</b>             |
| Maintenance Workers                        | 0.20              | $7.30 \times 10^{-4}$ | 4.11                     |
| Occasional Users/Trespassers (adolescents) | 0.51              | $4.28 \times 10^{-5}$ | 4.11                     |

\*Blood Lead Level Values in ug/dL (micrograms per deciliter)

In both areas the BLL for the construction worker was estimated to be above the 10ug/dL reference level.

The re-evaluation of Zone B does not eliminate the potential risk from exposure to asbestos in soil.

## **Ecological**

A qualitative ecological risk assessment considered the GPMA as a whole. Potential receptors considered in this assessment included insectivorous birds, granivorous birds, and herbivorous small mammals. Exposure to CoPC resulted in unacceptable risk to ecological receptors. Risk to insectivorous birds resulted from exposure to CoPC through dermal contact with surface soil, and ingestion of surface soil, plant material and insects. Exposure pathways for granivorous birds were included dermal contact with surface soil & ingestion of surface soil and plant materials, especially seeds, nuts and fruit. The majority of potential excess risk resulted from exposure to other CoPC, such as PAH and pesticides via dermal contact or ingestion of soil.

Herbivorous small mammals are exposed to CoPC through ingestion of surface soil and plant material, dermal contact with surface soil and ingestion and inhalation of fugitive dust from surface soil.

Erosion control measures have been implemented along the banks of GPMA. These control measures consist of riprap and gabions, which extend horizontally beyond the limit of low tide and vertically to the top of the steep slopes of the riverbank. The riprap and gabions provide minimal habitat for invertebrates and limit access to river sediment. Access to the inter-tidal zone by terrestrial animals is also limited by the barren, vertical nature of the gabions. Therefore, direct constituent release from site surface soils to sediment has been eliminated.

In summary the ecological assessment identified the surface soil as posing unacceptable risk through incidental ingestion, dermal contact, and inhalation of dust as well as ingestion of plant material and insects.

## **7) DEVELOPMENT AND SCREENING OF ALTERNATIVES**

### **Statutory Requirements/Response Objectives**

Under its legal authorities, EPA's primary responsibility for Superfund is to undertake remedial actions that are protective of human health and the environment. Section 121 of CERCLA established several other statutory requirements and preferences, including: a requirement that an EPA sponsored remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the COPC is a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these Congressional mandates.

Based on the reported results and physical characteristics of the GPMA, the principal migration pathways to potential exposures of COPC are limited to soil. Remedial action objectives (RAO) were identified based on the COPC, environmental media, exposure routes, and potential for risk to human and/or ecological receptors. RAOs were identified for both Zones A & B as those which:



1. Prevent direct contact and ingestion of soils;
2. Prevent inhalation of airborne asbestos from soil; and
3. Prevent direct contact and ingestion of COPC by ecological receptors.

Response actions were developed to meet the RAO. Technologies and process options identified to address the response actions were, then screened considering effectiveness, implementability, and cost associated with achieving the RAO. Remedial technologies and process options were considered in each of three general response action categories: No Action with Monitoring, Limited Action, and Containment.

### **Technology and Alternative Development and Screening**

CERCLA and the NCP set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for the site.

Section 2 of the FS, identified, assessed and screened technologies based on implementability, effectiveness, and cost. These technologies were combined into source control and management of migration alternatives. Section 3 of the FS presented remedial alternatives developed by combining the technologies identified in the previous screening process in the categories identified in Section 300.430 (e) (3) of the NCP. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Section 4 of the FS.

In summary, five of the remedial alternatives screened in Section 2 were retained for detailed analysis. Table identifies the five alternatives that were retained through the screening process, as well as those that were eliminated from further consideration.

## 8) DESCRIPTION OF ALTERNATIVES

This Section provides a narrative summary of each alternative evaluated. A detailed tabular assessment of each alternative can be found in Table 4.1 of the FS. Long-term shallow ground-water monitoring, as well as site and security inspections are included in all five alternatives. Institutional controls that provide legal notification of property condition are specified in all but Alternative 1. Long-term shallow ground water monitoring is included in Alternatives 1 and 2. Brief descriptions of each remedial alternative are presented below. It is assumed removal of the incinerator soils and incinerator decontamination will be accomplished to remove source areas in Alternatives 3, 4 & 5.

### *Alternative 1: No Action with Monitoring*

The No Action alternative consists of maintaining current site conditions. However, long-term ground-water monitoring and site inspection will be performed. No remedial actions will be undertaken to reduce potential human health and ecological risk. This alternative serves as a comparative baseline (i.e., existing conditions) alternative, as required by CERCLA. Monitoring programs include ground water sampling on a quarterly basis for the first year and annually thereafter, periodic air monitoring, site and security inspections, and 5-year reviews to evaluate whether additional remedial actions or continued monitoring are required. A report would be generated detailing each five-year review evaluation.

This alternative would not meet any of the RAOs.

### *Alternative 2: Limited Action*

The Limited Action alternative consists of developing and implementing institutional controls, in addition to the monitoring programs described in Alternative 1. Institutional controls (i.e., legal notification of property condition) will be implemented to limit future deterioration of site conditions and to restrict access.

This alternative would meet RAOs for 1) direct contact and ingestion of soils and 2) prevent inhalation of airborne asbestos from soil, but would not 3) prevent direct contact or ingestion of COPCs by ecological receptors. This action would also make the area useable for future use.

### *Alternative 3: Permeable Cover*

The Permeable Cover alternative consists of a geotextile/permeable liner and a vegetated soil cover. The liner will mark the location of the waste, but not eliminate infiltration of water. The cover will consist of two feet of soil which will be vegetated with native grasses and shrubs. This remedy prohibits exposure with the soil to protect human health and the environment. This alternative consists of the following remedial actions:

- ! Site preparation and modifications to the existing storm-water sewer system and utilities;
- ! Minor site grading and placement of a geotextile/permeable liner to establish a boundary between existing surface soil and clean fill. This liner will be covered by a 24 inch layer of soil;
- ! Establishment of institutional controls to restrict access and to minimize deterioration of site conditions; and

- ! Implementation of long-term monitoring and site inspection programs, as described in Alternative 1.

This alternative would meet all RAOs.

*Alternative 4: Impermeable Cap/Asphalt Layer*

An impermeable cap which consists of a 12-inch layer of clean fill/soil, covered by a 4-inch asphalt layer. The impermeable asphalt cap would isolate the soil from potential receptors. This alternative consists of the following remedial actions:

- ! Site preparation, and re-construction of existing storm-water sewer system;
- ! Construction of additional storm-water sewer lines;
- ! Minor site grading, supplemental soil filling, and placement of binding and wearing asphalt layers;
- ! Implementation of institutional controls to restrict access and to minimize deterioration of site conditions; and,
- ! Implementation of long-term monitoring and site inspection programs, as described in Alternative 1.

This alternative would meet all RAOs.

*Alternative 5: Impermeable Cap/Geomembrane*

An impermeable cap, which consists of a geomembrane liner and a 2.5 ft soil cover, required for frost protection, will be placed over Zone A. This impermeable cap would isolate COPC in surface and subsurface soil from potential receptors. This alternative consists of the following remedial actions:

- ! Site preparation, and re-construction of storm-water sewer system;
- ! Installation of new storm-water sewer lines;
- ! Minor site grading and placement of a 6-inch support layer, a geomembrane, a 30-inch layer of sandy soil for drainage, frost protection, and revegetation. Environmental restoration would consist of grass and shallow-rooted shrubs since the geomembrane would prohibit installation of deep-rooted trees. Therefore, natural succession to a mature forest would be prohibited since tree roots may impair the geomembrane. Environmental restoration reduces labor cost associated with mowing grass cover and the use of pesticides;
- ! Implementation of institutional controls to restrict access and to minimize or prevent deterioration of site conditions; and
- ! Implementation of long-term monitoring and site inspection programs., as described in Alternative 1.

This alternative would meet all RAOs.

## 9) SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121 (b) (1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The first two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP. The next five criteria are utilized to compare and evaluate the elements of one alternative to another that meet the threshold criteria. The last two are the modifying criteria used on the final evaluation of remedial alternatives generally after EPA has received public comment on the RI/FS and Proposed Plan. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are given below and summarized in Table 6:

***Overall Protection of Human Health and the Environment*** -addresses whether remedies are protective of human health and the environment. A remedy is protective if it adequately eliminates, reduces, or controls all current and potential site risks posed through each exposure pathway at the site.

***Compliance with ARAR*** - is one of the statutory requirements for remedy selection. However, CERCLA allows selecting a remedy that will not attain applicable or relevant and appropriate requirements (ARARs) if certain conditions exist.

***Long-term Effectiveness and Permanence*** - refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time after cleanup goals have been met.

***Reduction of Toxicity, Mobility, or Volume*** - addresses remedies that employ treatment as a principal element by ensuring that the relative performance of the treatment technologies will be assessed. This criterion examines the magnitude, significance, and irreversibility of reductions.

***Cost*** - includes capital costs and annual operations and maintenance costs incurred over the life of the remedial action. The present worth cost of the five alternatives are: Alternative 1 \$511,000, Alternative 2 \$812,000, Alternative 3 \$4,429,000, Alternative 4 \$5, 257,000, and Alternative 5 \$7,404,000.

***Short-term Effectiveness*** -refers to the short-term impacts of the remedy on the neighboring community, workers, or surrounding environment. This includes potential threats to human health and the environment associated with the removal, treatment, and transportation of hazardous substances.

***Implementability*** - is the technical and administrative feasibility of a remedy, as well as the availability of materials and services needed to implement the selected solution.

***State Acceptance*** - indicates whether the State concurs with, opposes, or has no comment on the preferred remedy.

*Community Acceptance* - will be addressed in the Responsiveness Summary.

For a more detailed comparative analysis of remedial alternatives see Table 4-1 in the FS, (Stone & Webster 1997d).

## 10) THE SELECTED REMEDY

The selected remedy was developed by combining components of different source control and management of mitigation alternatives to obtain a comprehensive approach for site remediation. The selected remedy for Zone A, Alternative 3, consists of a permeable cover, which consists of a geotextile/permeable liner and a vegetated soil cover. The selected remedy for Zone A consists of a permeable cover, which consists of a geotextile/permeable liner and a vegetated soil cover. The liner will mark the location of the waste, but not eliminate infiltration of water. The cover will consist of two feet of soil, which will be vegetated with native grasses and shrubs. This remedy prohibits exposure with the soil to protect human health and the environment. It also provides a vegetated buffer between the Schuylkill River (and its ecology) and the area adjacent to GPMA, which is proposed for heavy industrial reuse in the City of Philadelphia's Reuse Plan dated September 1994. The selected remedy for Zone B, Alternative 4, which consists of paving the area returns, the area to its former use as a parking lot and prohibits exposure with the soil to protect human health and the environment. The removal of soils and decontamination of the incinerator remove possible source areas and eliminate exposure to these areas.

The institutional controls, five-year reviews, and long term monitoring plan will ensure that the remedy will continue to be protective of human health and the environment. Based on current information, this alternative appears to provide the best balance of the nine evaluation criteria specified by the EPA and outlined above.

### Description of Remedial Components

This Alternative Involves the installation and long-term maintenance of a permeable cover at Zone A and paving at Zone B to mitigate potential risks to potential human and ecological receptors. The installation will consist of the following activities:

- ! The existing storm-water sewer system will be upgraded. Catch basins and manholes will be cleaned and repaired as necessary. The inlet of catch basins will be raised to the ground surface. Enlargement of the inlet collecting surface area of the catch basins may also be required. Temporary sediment control measurements around the catch basin will be installed to minimize sediment transport into the existing sewer system.
- ! Temporary staging areas will be constructed and vegetation, cover material (asphalt, concrete, etc.), and/or debris will be removed, as necessary for design.
- ! A geotextile/permeable liner will be placed over the existing soil. This liner will be covered by a minimum of 24 inches of soil suitable for supporting vegetation.
- ! The site will be graded and a vegetative cover (i.e., grass seeding and trees) will be added.
- ! Institutional controls will consist of placing legal notification of site conditions and limit on-site activities and minimize deterioration of site conditions.
- ! The following Institutional Controls
  - % Ground water withdrawn from wells shall not be used or made available for human consumption (Base-wide Institutional Control)
  - % GPMA shall not be used or developed for any permanent residential uses (Base-wide Institutional Control).

- % Any construction or development of an outdoor childcare playground will include the placement of 2 ft of clean fill material, or other cover as approved by PADEP, between the underlying soil and the surface of the childcare playground prior to commencement of any use of the outdoor area as a playground (Base-wide Institutional Control).
- % Excavation shall not be accomplished without prior written approval of PADEP.

! A long-term shallow ground water monitoring program will be implemented

Installation of the covering systems at Zone A will take approximately six to eight months to complete, following design and construction contract award. The ground water monitoring program will involve collecting developing a long term monitoring program, which will be reviewed by EPA and PADEP. Maintaining the permeable cover and individual zone conditions will take two to three weeks per year, which will include repairs to the permeable cover and inspection and maintenance of the existing bank stabilization. To the extent required by law, the Navy will review the site at least once every five years after the initiation of remedial action at the site, since COPC will remain at the site to assure that the remedial action continues to protect human health and the environment.

## 11) STATUARY DETERMINATIONS

The remedial action selected for implementation at the GPMA is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs to the extent practicable and is cost effective. The selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the mobility, toxicity or volume of COPC as a principal element.

### **The Selected Remedy is Protective of Human Health and the Environment**

The remedy will mitigate the risks posed to human health and the environment by controlling exposures to human and environmental receptors through engineering and institutional controls such as: a permeable cover, access restrictions, institutional controls, and site inspections and monitoring.

### **The Selected Remedy and ARARs**

This remedy will not attain applicable or relevant and appropriate federal and state requirements that apply to GPMA, since soil that reportedly contains concentrations of COPC above the cleanup standards will not be removed.. However, ARARs were attained to the extent practicable Environmental laws from which ARARs for the selected remedial action are derived, and the specific ARARs are listed in Tables 2-2, 2-3, and 2-4 in the FS. These tables are also found in the back of this document. A discussion of why these requirements are applicable or relevant and appropriate may be found in the FS Report in Section 2.0.

The primary location-, chemical-, and action-specific ARAR are summarized below:

#### Location-Specific

- ! *Soil* - This alternative will not comply with the ARAR in terms of mitigating the presence of CPC
- ! *Wildlife* - This alternative will comply with the requirements of the Endangered Species Act of 1973. This alternative will provide preventative measures to protect native biota from the

potential effects of exposure to COPC. Remedial activities for the site will be designed to protect against adverse effects to the biota and sensitive habitats.

- ! *Floodplains* - The 100-year flood elevation line is 10 ft. Elevations of the river bank along the GPMA range from 15 to 18 ft along the southwestern portion of the GPMA at IR Site 4 to 11 to 12 ft along the southern portion of the GPMA at IR Site 5 after bank stabilization. This alternative will meet protection from water of the 100 year flood.
- ! *Ground water* - ARAR for water quality will be used to evaluate monitoring data generated by the implementation of this alternative.

#### Chemical-Specific

- ! *Soil* - Pennsylvania's Act 2 Statewide Human Health Standards for Non-residential soil are the primary chemical-specific ARAR. The Permeable Cover alternative will not comply with this ARAR, as soil that reportedly exceeds these clean-up standards will not be removed.

#### Action-Specific

- ! Action-specific ARAR identified during the development of this alternative, focus on distributing information to workers and the community before implementing this alternative. Other action-specific ARAR applicable to this alternative include the federal Clean Air Act and the Pennsylvania Air Pollution Control Act and Regulations, which outline standards of air pollution control. Concentrations of airborne fugitive dust and asbestos may exceed standards during construction.

Since the presumptive remedy was utilized, all of the ARARs were not met.

#### **The Selected Remedial Action is cost-effective**

In the Navy's judgment, the selected remedy is cost effective, (i.e., the remedy affords overall effectiveness proportional to its costs). In selecting this remedy, the Navy identified alternatives that are protective of human health and the environment, and will attain ARARs to the extent practical. The Navy evaluated the overall effectiveness of each alternative by assessing the relevant three criteria: long term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, and short-term effectiveness, in combination. The relationship of the overall effectiveness to this remedial alternative was determined to be proportional to its costs. The principal capital cost components for the Permeable Cover alternative, \$2,278,000, will be associated with the installation of the permeable geotextile cover and fence, and the legal notification of site conditions and/or deed restrictions. The O&M costs incurred by implementing this alternative will be for performing monitoring and site inspection programs, and maintaining the fence and the vegetation cover. The annual cost for the initial two years was estimated to be \$167,000, followed by annual costs for each of the remaining years of \$117,000. The total present worth for this alternative was calculated using an interest rate of 5 percent and assuming that O&M activities will extend for a period of 30 years. This resulted in a present worth cost of \$4,429,000.

#### **The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable**

The selected remedy was evaluated using the best balance of trade-offs among alternatives in terms of: 1) long-term effectiveness and permanence, 2) reduction of toxicity, mobility or volume through treatment, 3) short-term effectiveness, 4) implementability, and 5) cost. The selected



remedy provides the best balance of trade-offs among the alternatives. Listed below is a summary of the five criteria used to evaluate the alternatives:

**Long-term Effectiveness and Permanence**

Implementation of the selected Alternative will reduce risk to potential receptors. COPC will be contained by a permeable covering, thereby minimizing contact between COPC and human and ecological receptors. The long-term monitoring and site inspection programs will document the continued effectiveness of this alternative. The long-term effectiveness of this alternative is expected to be high, but the permanence of this alternative will depend upon continual maintenance of the permeable covering system.

**Reduction of Toxicity, Mobility, or Volume Through Treatment**

The Permeable Cover alternative does not include any treatment or removal and off-site disposal activities, rather this alternative is designed to isolate soil from receptors. Consequently, this alternative will not reduce the toxicity, mobility, or volume of COPC through treatment. However, the toxicity of COPC will be reduced over time through attenuation and degradation. Overall, the Permeable Cover alternative will not satisfy the regulatory preference for treatment as a possible component of a remedial action.

**Short-term Effectiveness**

While implementing this alternative, there may be elevated risks to workers and to the environment. Potential elevated risk to workers will result from inhalation of fugitive dust. To reduce this risk, workers performing the installation activities may be required to utilize personal protective equipment and/or minimize their exposure to COPC in fugitive dust. Short-term risks to the community will be minimal due to the distance from the site to residential housing. Additional protection measures (e.g. dust control) would be used to mitigate the risks. Short-term impacts to the environment will be minimized, to the extent possible, through the use of common erosion controls such as sedimentation barriers. Concentrations of COPC will not be reduced to a level protective of potential receptors and this alternative will not provide the controls necessary to reduce the concentrations of COPC in soil.

**Implementability**

**Technical Feasibility** - Construction of a permeable covering will be moderately difficult to implement. The implementation of this alternative will require the use of equipment and services commercially available from local vendors. Components and items associated with this alternative are commonly available. Accessibility to the site by the necessary vehicles is also available. The Permeable Cover alternative will not limit or interfere with potential future remedies.

**Administrative Feasibility** - Implementation of the Permeable Cover alternative, including installation of the cover and the supervision of the monitoring programs, will require approval and close coordination with local, state and federal agencies. The implementation of institutional controls and access restrictions associated with this alternative will require administrative and regulatory support from local, state and federal agencies. No administrative difficulties are expected with the implementation of the Permeable Cover alternative.

**Cost**

**Capital Cost** - The principal capital cost components for the Permeable Cover alternative, \$2,278,000, will be associated with the installation of the permeable geotextile cover, and the development and installation of deed notifications and/or zoning restrictions.

**O&M Cost** - The O&M costs incurred by implementing this alternative will be for performing ground-water monitoring and site inspection programs, and maintaining the fence and the vegetation cover. The annual cost for the initial two years was estimated to be \$167,000, followed by annual costs for the remaining years of \$117,000.

**Present Worth** - The total present worth for this alternative was calculated using an interest rate of 5 percent and assuming that O&M activities will extend for a period of 30 years. This resulted in a present worth cost of \$4,429,000. A summary of costs and assumptions for this alternative are presented in the FS.

**The Selected Remedy does not Satisfy the Preference for Treatment which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume of the COPC as a Principal Element**

The principal element of the selected remedy is source control, which addresses soil. Since the presumptive remedy is utilized, the selected remedy does not satisfy the statutory preference for treatment as a principal element. Treatment and/or removal of the landfill material were considered impractical due to the heterogeneity and volume of the landfill material, therefore the primary remedial components are source control and containment.

**12) STATE ROLE**

PADEP has reviewed the various alternatives and has indicated its support for the selected remedy. State has also reviewed the *IR Site 4 RI Report*, *IR Site 5 Report*, *IR Site 3 ROD*, *Site Characterization Report*, and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate state environmental laws and regulations. PADEP concurs with the selected remedy for the GPMA.

**LIST OF ACRONYMS AND ABBREVIATIONS**

|                  |  |
|------------------|--|
| <i>AE</i>        | <i>Average exposure</i>  |
| <i>ARARs</i>     | <i>Applicable or Relevant and Appropriate Requirements</i>                 |
| <i>bgs</i>       | <i>Below ground surface</i>  |
| <i>BRAC</i>      | <i>Base Realignment and closure Account</i>                                |
| <i>CERCLA</i>    | <i>Comprehensive Environmental Response compensation and Liability Act</i> |
| <i>COPC</i>      | <i>Constituents of Potential Concern</i>                                   |
| <i>DERA</i>      | <i>Defense Environmental Restoration Account</i>                           |
| <i>EPA</i>       | <i>United States Environmental Protection Agency</i>                       |
| <i>FS</i>        | <i>Feasibility Study</i>   |
| <i>ft</i>        | <i>Feet</i>  |
| <i>GPMA</i>      | <i>Girard Point Management Area</i>  |
| <i>HI</i>        | <i>Hazard Index</i>  |
| <i>IR</i>        | <i>Installation Restoration Program</i>                                    |
| <i>msl</i>       | <i>Mean sea level</i>  |
| <i>NCP</i>       | <i>National Oil and Hazardous Substances Pollution Contingency Plan</i>    |
| <i>NGVD 1929</i> | <i>National Geodetic Vertical Datum 1929</i>                               |
| <i>NWPL</i>      | <i>North West Parking Lot</i>  |
| <i>O&amp;M</i>   | <i>Overhead and Maintenance</i>  |
| <i>PADEP</i>     | <i>Pennsylvania Department of Environmental Protection</i>                 |
| <i>PAH</i>       | <i>polynuclear Aromatic Hydrocarbons</i>                                   |
| <i>PCB</i>       | <i>Polychlorinated Biphenyls</i>   |
| <i>QA\QC</i>     | <i>Quality Assurance\Quality Control</i>                                   |
| <i>RAB</i>       | <i>Restoration Advisory Board</i>  |
| <i>RAO</i>       | <i>Remedial Action Objectives</i>  |
| <i>RCRA</i>      | <i>Resource Conservation and Recovery Act</i>                              |
| <i>RfD</i>       | <i>Reference Dose</i>  |
| <i>RI</i>        | <i>Remedial Investigation</i>  |
| <i>RME</i>       | <i>Reasonable Maximum Exposure</i>   |
| <i>SVOC</i>      | <i>Semi-Volatile Organic Compounds</i>                                     |
| <i>TRC</i>       | <i>Technical Review Committee</i>  |
| <i>UST</i>       | <i>Underground Storage Tank</i>  |

| Alternative   | Cost  | Justification  |
|---|---|--|
| <p><i>Alternative 1: No Action with Monitoring</i></p> <p>The No Action alternative consists of maintaining current site conditions. However, long-term ground-water and air monitoring and site inspection will be performed. No remedial actions will be undertaken to reduce potential human health and ecological risk. This alternative serves as a comparative baseline (i.e., existing conditions) alternative, as required by CERCLA. Monitoring programs will be performed on a quarterly basis for the first year and annually thereafter. Five year reviews will be conducted</p>  | <p>\$511,000<br/>Total</p>  | <p>Identified only as a base line for comparison.<br/>This action would meet none of the RAOs.</p>   |
| <p><i>Alternative 2: Limited Action</i></p> <p>The Limited Action Alternative consists of developing and implementing institutional controls, and implementing long-term ground-water and air monitoring, and site inspection programs. Institutional controls (legal notification of site conditions and/or zoning restrictions, fencing and signs) will be implemented to limit future deterioration of site conditions and to restrict access, in addition to the monitoring and site inspection programs described in Alternative 1.</p>  | <p>\$812,000<br/>Total</p>  | <p>This action would limit any access to the site. This alternative would meet RAOs for 1) direct contact and ingestion of soils and 2) prevent inhalation of airborne asbestos from soil, but would not 3) prevent direct contact or ingestion of COPCs by ecological receptors. This action would also make the area useable for future use.</p> |
| <p><i>Alternative 3: Permeable Cover</i></p> <p>The permeable cover consists of a geotextile/ permeable liner and a vegetated soil cover. This alternative consists of the following remedial actions:</p> <ul style="list-style-type: none"> <li>• Site preparation and modifications to the existing storm-water sewer system and utilities;</li> <li>• Minor site grading and placement of a geotextile/permeable liner to establish a boundary between existing surface soil and clean fill. This liner will be covered by a 24-inch layer of soil/clean fill;</li> <li>• Establishment of institutional controls to restrict access and to minimize deterioration of site conditions; and</li> <li>• Implementation of long-term monitoring and site inspection programs described in Alternative 1..</li> </ul> <p>Five-year reviews will be conducted.</p>   | <p>Zone A<br/>\$3,190,000<br/>Zone B<br/>\$1,239<br/><br/>Total<br/>\$4,429,000</p>     | <p>This was the chosen alternative for Zone A, as it meets all RAOs.</p>   |
| <p><i>Alternative 4: Impermeable Cap/Asphalt layer</i></p> <p>An impermeable cap which consists of a 12-inch layer of soil/clean fill, covered by a 4-inch asphalt layer. The impermeable asphalt cap will isolate the soil from potential receptors. This alternative consists of the following remedial actions:</p> <ul style="list-style-type: none"> <li>• Site preparation, and re-construction of existing storm-water sewer system;</li> <li>• Construction of additional storm-water sewer lines;</li> <li>• Minor site grading, supplemental soil filling, and placement of binding and wearing asphalt layers;</li> <li>• Implementation of institutional controls to restrict access and to minimize deterioration of site conditions; and</li> <li>• Implementation of long-term monitoring and site inspection programs described in Alternative 1.</li> </ul>  | <p>Zone A<br/>\$3,787,000<br/>Zone B<br/>\$1,470,000<br/><br/>Total<br/>\$5,257,000</p> | <p>This option meets all RAOs, however, for Zone A, this option would eliminate all wildlife habitat, and viewed as inconsistent with and contrary to Navy trustee protection responsibilities. Therefore, this alternative was chosen for Zone B which was an existing parking lot.</p>   |
| <p><i>Alternative 5: Impermeable Cap/Geomembrane</i></p> <p>An impermeable cap, which consists of a geomembrane liner and a 2.5 ft soil cover, required for frost protection. This impermeable cap will isolate the COPC in surface and subsurface soil. This alternative consists of the following remedial actions:</p> <ul style="list-style-type: none"> <li>• Site preparation, and re-construction of storm-water sewer system;</li> <li>• Installation of new storm-water sewer lines;</li> <li>• Minor site grading and placement of a 6-inch support layer, a geomembrane, a 30-inch layer of sandy soil for drainage, frost protection, and re-vegetation. Environmental restoration would consist of grass and shallow-rooted shrubs since the geomembrane would prohibit installation of deep-rooted trees. Therefore, natural succession to a mature forest would be prohibited since tree roots may impair the geomembrane Environmental restoration reduces labor cost associated with mowing grass cover and the use of pesticides;</li> <li>• Implementation of institutional controls to restrict access and to minimize or prevent deterioration of site conditions; and</li> <li>• Implementation of long-term monitoring and site inspection programs described in Alternative 1.</li> </ul> | <p>Zone A<br/>\$5,331,000<br/>Zone B<br/>\$2,073,000<br/><br/>Total<br/>\$7,404,000</p> | <p>This option would meet all RAOs, but an impermeable cover described by this alternative was not required.</p>   |

Cost is total present worth for 30 years at 5 percent. Present worth is defined as expenditures that occur over time by discounting future costs to a common base year.

**Table 4 Comparison of Alternatives, Costs & Justification**

| Remedial Alternatives                           | Protection of Human Health and Environment Ranking | Compliance with ARARs Ranking | Long-Term Effectiveness Ranking | Reduction in TMV <sup>(a)</sup> through Treatment Ranking | Short-term Effectiveness Ranking | Implementability Ranking | Cost   | State Acceptance | Community Acceptance Ranking |
|---|--|-------------------------------|---------------------------------|---|----------------------------------|--------------------------|--|------------------|------------------------------|
| Alternative 1 – No Action                       | Poor   | Poor                          | Poor                            | No Treatment  | Poor                             | Good                     | \$511,000 Total  | Poor             | No Community Comments        |
| Alternative 2 – Limited Action                  | Poor   | Poor                          | Poor                            | No Treatment  | Moderate                         | Good                     | \$812,000 Total  | Poor             | No Community Comments        |
| Alternative 3 – Permeable Cover                 | Good   | Moderate                      | Moderate                        | No Treatment  | Moderate                         | Good                     | Zone A<br>\$3,190,000<br>Zone B<br>\$1,239<br><br>Total<br>\$4,429,000     | Good             | No Community Comments        |
| Alternative 4 – Impermeable Cover/Asphalt Layer | Good   | Moderate                      | Moderate                        | No Treatment  | Moderate                         | Moderate                 | Zone A<br>\$3,787,000<br>Zone B<br>\$1,470,000<br><br>Total<br>\$5,257,000 | Good             | No Community Comments        |
| Alternative 5 – Impermeable Cover/Geomembrane   | Good   | Moderate                      | Moderate                        | No Treatment  | Moderate                         | Moderate                 | Zone A<br>\$5,331,000<br>Zone B<br>\$2,073,000<br><br>Total<br>\$7,404,000 | Good             | No Community Comments        |

**Good** indicates the alternative meets the intent of the criteria.

**Moderate** indicates the alternative partially meets the intent of the criteria.

**Poor** indicate the alternative does not meet the intent of the criteria.

To be Determined indicates this criteria will be evaluated following the public comment period.

(a) TMV indicates Toxicity, Mobility and Volume.

**TABLE 5**  
**COMPARATIVE RANKING OF ALTERNATIVES TO NINE CERCLA CRITERIA**

### 13) RESPONSIVENESS SUMMARY

The public comment period for the Proposed Plan ended on July 2, 1998 with no public written and only one verbal comment received. The oral comment was made via telephone and requested consideration be given to reusing the incinerator as a crematory. The caller was referred to PIDC for possible reuse consideration. EPA & PADEP have commented on a draft version of this document and their comments have been incorporated.

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*Response to EPA Comments dated June 19, 1998 (letter attached)*

Responses have been *italicized*.

1. Comment: Under Section 1- Introduction, long term monitoring is applicable to shallow ground water only and institutional controls restrict use of ground water as a potable source.

*Response: The Navy agrees with this comment, and the ROD has been prepared to reflect this.*

2. Comment: Section 3 identifies institutional controls to protect construction workers as part of the response action but protection of construction workers is not identified as part of the proposed alternative described in Section 1. Since removal of contaminated soil will still result in unacceptable blood-lead levels for construction workers (see Table 3) then institutional controls for prohibition of residential use and protection of construction workers are required.

*Response: The ROD indicates that GPMA shall not be used or developed for any permanent residential uses (Base-wide Institutional Control), and excavation shall not be accomplished without prior written approval of PADEP.*

3. Comment: Page 2 - The year or time frame when removal actions were implemented will be useful.

*Response: The Navy agrees and has made the changes to the ROD.*

4. Comment: Page 3 - A more definitive cleanup level for surface soils surrounding the incinerator and the contaminants to be removed would be more useful than a risk ratio comparison.

*Response: The Navy agrees and has made the changes to the ROD.*

5. Comment: It would be helpful to identify the number of acres covered by landfill cover for Zone A and the asphalt cover for Zone B. It is not clear from the text and the attached drawing is not legible.

*Response: The acreage is included in the ROD along with a clearer drawing.*

6. Comment: Page 4, last paragraph – Table 2 refers to Zone B, not Zone A as stated in the text.

*Response: The Navy agrees and has made the changes to the document.*

7. Comment It is not clear from Table 2 and 3 that Building 668 refers to incinerator soil.

*Response: The Navy agrees and has clarified this in the ROD.*

*Response to PIDC Comments dated June 19, 1998 (letter attached)*

Responses have been *italicized*.

1. Comment: This inspection (of landfill caps) should be part of the Navy's proposed plan for monitoring. Also, the Navy should take responsibility for long term inspection and maintenance of the bank stabilization. The Navy completed the bank stabilization to contain and control the contaminated area's runoff into the surrounding rivers.

*Response: We agree inspection of the cover and bank stabilization should be part of the monitoring and maintenance, and will be the responsibility of the Navy as long as it owns the property. Subsequent, responsibility for maintenance may be a matter of discussion during the development of a property transfer agreement.*

2. Comment: Finally, the Navy's plan should include demolition of the incinerator building with the stack. The building's poor roof drainage, leaky roof and openings around the windows and doors provide ample opportunity for water and moisture to infiltrate the building thus becoming a safety threat for implosion.

*Response: Demolition will only encompass the stack. A structural engineering evaluation (Stone & Webster, May 1997) was accomplished which indicated that the structural integrity of the incinerator is currently intact and may become be a hazard only if left to deteriorate for an indefinite period of time. As the City intends to demolish the incinerator, maintenance and inspection will be accomplished until transfer of the property.*



*Response to DOI Comments dated June 18, 1997 (letter attached)*

Responses have been *italicized*.

Comment: Recently, the U.S. Fish and Wildlife Service's representative to the EPA Region 3 Biological Technical Assistance Group informed us that the Navy is re-considering it's initial thoughts about the landfill cover and may propose to place asphalt over the entire landfill areas. You would agree that replacing the vegetative cover in the landfill areas with an asphalt cover would eliminate all wildlife habitat, and further that this could be viewed as inconsistent with and contrary to our joint protection responsibilities [NCP Section 300.600(b)(2) and (3)] as co-trustees for natural resources (e.g., migratory birds) affected by this decision.

*Response: Only the area previously a parking lot, will have an asphalt cover. The remainder of the landfill cover will be a vegetative cover.*

## Response to PADEP Comments dated May 28, 1998 (e-mail attached)

1. Comment: Page 1: "Restriction on Excavation without Prior Pennsylvania Department of Environmental Protection (PADEP) Approval". Please rewrite as: "Restriction on Excavation without Prior Approval in Writing by the Pennsylvania Department of Environmental Protection (PADEP)".

*Response: The wording has been revised as requested.*

2. Comment: Please rewrite the sentence to say that "The general land area surrounding the GPMA is NOT densely populated. "Please correct this statement in the Site Background section. The area IS heavily industrialized.

*Response: This section has been corrected.*

3. Comment: "The site was initially marshlands and was reclaimed by extensive filling between 1940 to 1970". Please rewrite this sentence in the Site Background section. How about " The site was marshlands until it was covered with fill material" ?

*Response: The wording has been revised as suggested*

4. Comment: How and where will the incinerator stack and incinerator units be removed and disposed off-site?

*Response: First all the ash will be removed form the stack and incinerator units. The units will then be cut-up in place and disposed The exterior of the stack will be completely wetted with a water spray. A crane with grapple or clamshell attachments shall be used to dismantle the stack in sections from the top down. The stack debris will be immediately placed in trucks for off-site disposal.*

#### **14) REFERENCES**

Remedial Investigation Report: IR Site 4 at Philadelphia Naval Base, Stone & Webster Environmental Technology & Services, Final, May 1997 (Stone & Webster 1997a)

Remedial Investigation Report: IR Site 5 at Philadelphia Naval Base, Stone & Webster Environmental Technology & Services, Final, May 1997 (Stone & Webster 1997b)

Site Characterization Report Girard Point Management Area at Philadelphia Naval Base, Stone & Webster Environmental Technology & Services, Final, September 1997 (Stone & Webster 1997c)

Feasibility Study for Girard Point Management Area at Philadelphia Naval Base, Stone & Webster Environmental Technology & Services, Final, October 1997 (Stone & Webster 1997d)

Engineering Evaluation/Cost Analysis for Building Decontamination/Demolition Girard Point Incinerator - Building 668, Stone & Webster Environmental Technology & Services, Final, May 1997 (Stone & Webster 1997e)



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
841 Chestnut Building  
Philadelphia, Pennsylvania 19107-4431**

June 2, 1998

Mr. Emil Klawitter  
Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway  
Mail Stop #82  
Lester, Pennsylvania 19113-2090

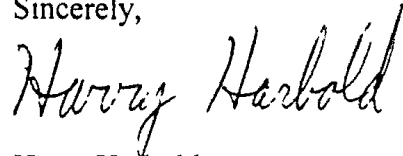
Dear Mr. Klawitter:

As we discussed today by telephone, EPA has the following comments regarding the draft Proposed Plan for the Girard Point Management Area:

1. Under Section 1-Introduction, long term ground water monitoring is applicable to shallow ground water only and institutional controls restrict use of ground water as a potable source.
2. Section 3 identifies institutional controls to protect construction workers as part of the response action but protection of construction workers is not identified as part of the proposed alternative described in Section 1. Since removal of contaminated soil will still result in unacceptable blood-lead levels for construction workers (see Table 3) then institutional controls for prohibition of residential use and protection of construction workers are required.
3. Page 2-The year or time frame when the removal actions were implemented would be useful.
4. Page 3-A more definitive cleanup level for surface soils surrounding the incinerator and the contaminants to be removed would be more useful than reference to a risk ratio comparison.
5. It would be helpful to identify the number of acres covered by landfill cover for Zone A and the asphalt cover for Zone B. It is not clear from the text and the attached drawing is not legible.
6. Page 4, last paragraph-Table 2 refers to Zone B, not Zone A as stated in the text.
7. It is not clear from Table 2 and 3 that Building 668 refers to incinerator soil.

You may contact me at 215-566-3203 if you wish to discuss these comments further.

Sincerely,

A handwritten signature in black ink that reads "Harry Harbold". The signature is written in a cursive style with a large, stylized 'H' and a long, sweeping underline.

Harry Harbold  
Federal Facilities Branch

cc: Sarah Pantemidou

## OFFICE OF DEFENSE CONVERSION

Philadelphia Industrial  
Development Corporation

June 19, 1998

Mr. Emil Klawitter, Project Manager  
Northern Division, Naval Facilities Engineering Command  
Environmental Division, Code 1821  
10 Industrial Highway, Mail Stop 82  
Lester, PA 19113-2090

Dear Mr. Klawitter:

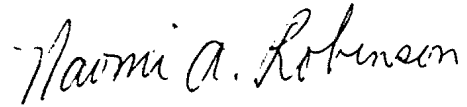
The City of Philadelphia is pleased to have the opportunity to comment on the Proposed Plan Girard Point Management Area. The City of Philadelphia has concerns with the Navy's preferred alternative because it does not correctly specify that the Navy is responsible for the integrity of the 2 caps and the bank stabilization. The Proposed Plan indicates that EPA's presumptive remedy guidance for the closure of CERCLA Municipal Waste Land Fills has been utilized. As I'm sure you are aware, this guidance requires the inspection and maintenance of land fill caps. This inspection and maintenance program should be part of the Navy's proposed plan for monitoring. Also, the Navy should take responsibility for long term inspection and maintenance of the bank stabilization. The Navy completed the bank stabilization to contain and control the contaminated area's runoff into the surrounding rivers.

Finally, the Navy's plan should include demolition of the incinerator building with the stack. The building's poor roof drainage, leaky roof and openings around windows and doors provides ample opportunity for water and moisture to infiltrate the building thus becoming a safety threat for implosion.

Mr. Emil Klawitter  
June 19, 1998  
Page two

Please feel free to contact me at (215) 496-8184 with any questions.

Sincerely yours,

A handwritten signature in cursive script that reads "Naomi A. Robinson".

Naomi A. Robinson  
Environmental Specialist

cc: Julie Van Nostern  
Lori Flynn  
Sarah Pantelidou, PADEP  
Harry Harbold, EPA



# United States Department of the Interior

## OFFICE OF THE SECRETARY

Office of Environmental Policy and Compliance  
Custom House, Room 244  
200 Chestnut Street  
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

June 18, 1997

Emil Klawitter, P.E.  
Naval Facilities Engineering Command  
10 Industrial Highway  
Mail Stop #82  
Lester, Pennsylvania 19113-2090

Dear Mr. Klawitter:

Thank you for providing this office with a copy of your April 7 memorandum which summarizes the April 1 meeting discussion on ecological issues that concern the Philadelphia Naval Base. We appreciate the opportunity to participate in this meeting and field review, and we agree that the meeting was productive and informative.

During the field visit portion of the meeting you pointed out the landfill areas (Sites 4 and 5) which comprise the majority of the Girard Point management Area. Although we did not spend much time walking through these areas, our observations of the vegetation correspond generally to the information presented in Section 3 of the November 21, 1996 draft Characterization Report. The existing vegetation is comprised of herbaceous and woody species that ranges from sparse to moderately dense, young growth. Although plans for remediating the landfills remain incomplete, you indicated that the Navy intends to propose that part (half?) of the landfill areas be covered with asphalt with the remainder maintained in vegetation. You also indicated that the Navy would be interested in obtaining the Department's assistance in developing a suitable revegetation plan.

Recently, the U.S. Fish and Wildlife service's representative to the EPA 3 Biological Technical Assistance Group informed us that the Navy is re-considering it's initial thoughts about the landfill cover and may propose to place asphalt over the entire landfill areas. You would agree that replacing the vegetative cover in the landfill areas with an asphalt cover would eliminate all wildlife habitat, and further that this could be viewed as inconsistent with and contrary to our joint protection responsibilities [NCP Section 300.600 (b) (2) and (3)] as co-trustees for natural resources (e.g., migratory birds) affected by this decision.

I would appreciate an indication as to how the Navy intends to fulfill its trust responsibilities at Girard Point and how the Department of the Interior may be of assistance. A potentially



useful contact in this matter is LCDR Dave Fields, Special Assistant for Ship and Air Systems, Environmental Protection Division, Chief of Naval Operations (Code N452), Crystal Plaza Five, Room 654, 2211 South Clark Place, Arlington, Virginia, 222445108, telephone: 703-604-5419, telefax: 703-602-5364. We are informed that LCDR Fields has been tasked to prepare guidance on the Navy's trustee role in such situations.

Thank you for your assistance in this matter.

Sincerely,

A handwritten signature in black ink that reads "Don Henne". The signature is written in a cursive style with a long horizontal stroke at the end.

Don Henne  
Regional Environmental Officer

cc:

D. Rosenberger, NRTR, OEPC, WASO  
D. Densmore, FWS, State College, PA  
T. Fannin, FWS, Hadley, MA

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To: JOE M ROCHE,EMIL E KLAWITTER  
To: PANTELIDOU.SARAH@al.pader.gov  
From: SMTP  
Cc: GATEWAY@NORTHDIVCOM[<harbold.harry@epamail.epa.gov>]  
Bcc:  
Subject: Review of Proposed Plan, GPMA, Philadelphia  
Attachment: Headers .822  
Date: 5/28/98 9:35 AM

I have reviewed the draft Proposed Remedial Action Plan for the Girard Point Management Area, Philadelphia Naval Complex, Philadelphia, Pennsylvania. I have the following comments:

1. Page 1: "Restriction on Excavation without Prior Pennsylvania Department of Environmental Protection (PADEP) Approval". Please rewrite as' "Restriction on Excavation without Prior Approval in Writing by the Pennsylvania Department of Environmental Protection (PADEP)".

2. Page 2 : Please rewrite the sentence to say that "The general land area surrounding the GPMA is NOT densely populated." Please correct this statement in the Site Background section. The area IS heavily industrialized.

3. Page 2: "The site was initially marshlands and was reclaimed by extensive filling between 1940 to 1970". Please rewrite this sentence in the Site Background section. How about "The site was marshlands until it was covered with fill material" ?

4. Page 3: Fourth paragraph: How and where will the incinerator stack and incinerator units be removed and sidposed off-site?

This concludes my comments.